

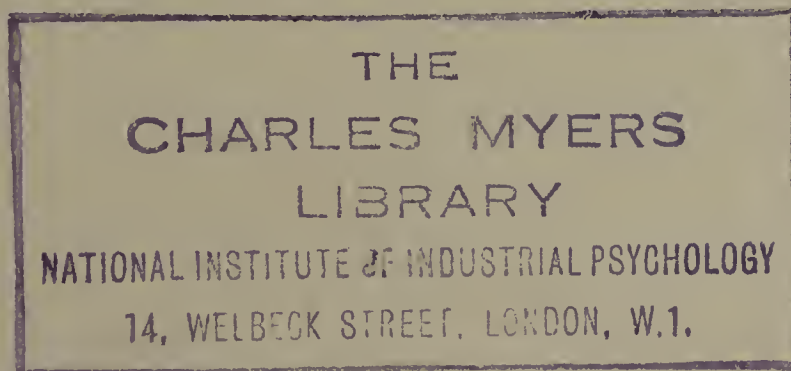
A CONTRIBUTION TO THE STUDY OF SHELL SHOCK

BEING AN ACCOUNT OF THREE CASES OF LOSS OF
MEMORY, VISION, SMELL, AND TASTE, ADMITTED
INTO THE DUCHESS OF WESTMINSTER'S WAR
HOSPITAL, LE TOUQUET

BY

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Reprinted from THE LANCET, February 13, 1915

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THE remarkably close similarity of the three cases which are described in this paper is shown in the following synopsis :—

| — | Case 1. | Case 2. | Case 3. |
|----------------------|---|---|----------------------------------|
| Cause... .. | Shells bursting about him when hooked by barbed wire. Preceding period of sleeplessness. | Shell blowing trench in. As in Case 1. | Shell blew him off a wall. ? |
| Vision ... | Amblyopia. Reduced visual fields. | „ | As in Case 1. |
| Hearing ... | Slightly affected for a brief time. | Not affected. | As in Case 2. |
| Smell | Reduced acuity. | Total anosmia. | Unilateral anosmia and parosmia. |
| Taste | Almost absent. | Reduced acuity. | As in Case 2. |
| Other sensations ... | Not affected. | As in Case 1. | As in Case 1. |
| Volitional movements | „ | „ | „ |
| Defæcation | Bowels not opened for five days following shock. | „ | „ |
| Micturition | Urine not passed for 48 hours. | Not affected. | As in Case 2. |
| Memory ... | Apparently slightly affected. | Very distinct amnesia. | „ |
| Result of treatment | Gradual improvement by rest and suggestion. | As in Case 1, supplemented by hypnosis | As in Case 1. |

CASE 1.—Private, aged 20. Admitted on Nov. 5th, 1914. On the nights of Oct. 28th and 29th he slept in the booking hall of X station; “not much sleep there.” On the 30th he motored in a ’bus from X to Y, arriving there at 7.30 P.M.; billets found at 8 P.M.; on guard from 10–11.30 P.M., and from 1.45–3.45 A.M. At 11 A.M. on the 31st for the first time he went to the firing line. His platoon advanced to one set of trenches and then crossed the road to another, only to find it filled with cavalry and to be told that there was no room for them. During the retirement from this trench, at 1.30 P.M., they were “found” by the German artillery. Up to that time he had not been feeling afraid; he had “rather been enjoying it,” and was in the best of spirits until the shells burst about him.

He was now retiring over open ground, kneeling on both knees and trying to creep under wire entanglements, when two or three shells burst near him. As he was struggling to disentangle himself from the wire three more shells burst behind and one in front of him. (An eye-witness in this hospital says that his escape was a sheer miracle.) After the shells had burst he succeeded in getting back under the wire entanglements; all his comrades had retired already. He managed to get into a trench, and as the firing slackened he rejoined his company. Immediately after the shell had burst in front of him his sight became blurred. It hurt him to open his eyes, and they “burned” when closed. The right eye seemed to have “caught it” more than the left. At the same moment he was seized with shivering, and cold sweat broke out especially round the loins. He thinks the shell behind him gave him the greater shock—“like a punch on the head, without any pain after it.” The shell in front cut his haversack clean away and bruised his side, and apparently it burned his little finger. It was this shell, he says, which “caused his blindness.”

Falling in with two comrades, he was led by them, one on either side, to the dressing station. He opened his eyes occasionally to see where he was going, but everything appeared blurred except at the first moment of opening. There was no doubling of objects; they seemed to “dissolve.” He was crying the whole time and worrying as to whether he was going blind. He kept turning over in his mind the succession of events from the beginning of the advance to the bursting of the shells. At the dressing station he was still crying and shivering; he was taken thence to a hospital by horse ambulance, where he was given brandy, and then sent on by horse ambulance to another hospital, and thence by motor ambulance at night to X, where he arrived early on Nov. 1st. He thinks he must have slept on the ambulances, as he *remembers nothing*.

From Nov. 1st to 4th at X; his eyes were bandaged and drops were instilled which “burnt terribly.” No numbness or anæsthesia observed. *Slight deafness*, which soon

passed off. On Nov. 1st he shivered in bed almost incessantly; his thoughts were still running on events between the advance and the bursting of the shells. No shivering after Nov. 3rd. He says he *did not micturate* from Oct. 30th P.M. until Nov. 2nd P.M., and *did not defæcate* from Oct. 30th until Nov. 5th (after aperient here). No involuntary passage of urine or fæces.

Past history.—He had been for two months in the Aisne district on the lines of communication, sleeping badly all that time owing to lumbar pains (and toothache during the first three weeks). He had failed to pass a medical examination some time previously because of renal trouble (abnormal amount of albumin in water) until after a long period of treatment. He had had lumbar pains a few nights before coming to France.

Present condition.—*Nov. 6th.*—A well-nourished man of nervous temperament, flushed complexion, and dark eyes. Movements normal; skin sensations normal. Eyes, fundi normal. *Fields distinctly contracted*, especially on temporal sides. Right eye—can read at normal distance, but “things have a slight haze round them.” Left eye—the haze is much greater; is unable to see letters until they are quite near.

Nov. 7th.—Says he has lost his sense of taste and smell since the shells burst round him. Gets up now.

Nov. 9th.—Woke up last night and found himself crying, “not thinking of anything in particular”; he at once “pulled himself together.”

Nov. 10th.—Tested for *taste* (tongue protruded) and *smell* in order mentioned :—

- | | | |
|-------------------------------|-----|---|
| (1) Very strong sol. of sugar | ... | Slightly sweet (only tasted after the tongue had been moved about). |
| (3) „ „ „ salt | ... | No taste. |
| (4) „ „ „ acid | ... | No taste, but “a peculiar feeling as if it dried the tongue.” |
| (7) „ „ „ quinine | ... | No taste (later, “a peculiar feeling of biting on the tongue”). |
| (5) Carbolic acid (1 : 40) | ... | No smell. |
| (6) Ether | ... | Faint smell, like collodion. |
| (8) Peppermint (strong) | ... | Faint smell of peppermint. |
| (2) Tincture of iodine | ... | No smell. |

Hypnosis tried; patient explains later—“I insisted on resisting.” *Suggestions* offered during concentration. *Nov. 13th.*—Says his taste and smell are returning. Fields of vision still

restricted, perhaps slightly less so. *Nov. 15th.*—He was transferred to England for further treatment.

On Nov. 16th the patient was admitted to the Middlesex Hospital, London, under the care of Mr. Arnold Lawson, who has kindly allowed me to append his note of the condition of the patient's eyes:—

$$\text{Nov. 25th: R. E.} \frac{\quad}{\quad} \left| \begin{array}{c} +1.75 \\ +2.25 \end{array} \right., \quad \text{L. E.} \frac{\quad}{\quad} \left| \begin{array}{c} -1 \\ +2 \end{array} \right..$$

Visual acuity, each eye 6/36; when under correction 6/18. Just below and to the outer of the left disc is a small clear buff patch in the choroid. The upper inner margins of the discs are somewhat blurred and more densely white than elsewhere. These features are probably not pathological. The fields are definitely restricted, especially on the nasal side of the retina, being limited here to 40° in the right eye and to 70° in the left. No central scotoma. Taste and smell were found affected on admission, but these recovered earlier.

Nov. 27th.—General condition improved. Not so “nervy.” Visual acuity under correction, R.E. 6/24, L.E. 6/18. The patient is now (Feb. 1st) attending the hospital as an out-patient

CASE 2.—Corporal, aged 25. Admitted on Dec 11th, 1914. The patient says that he was buried for 18 hours on Dec. 8th owing to a shell bursting and “blowing in” the trench in which he lay. Can remember nothing until he found himself in a dressing station at a barn lying on straw. He says that then he could not see and that for this reason he fell over something when he got up and walked about there. As to his past history, he came out to the war on August 13th, and was in the last two days’ retreat at Mons and after at La Bassée. Has slept very badly since the start, often when billeted taking large doses of whisky to procure sleep. Has led a “fast” life and has had recent domestic worry.

Present condition.—*Dec. 12th.*—A healthy-looking man with flushed face and large dark eyes with wide pupils. His general manner does not inspire one with confidence in his reliability. Complains of pains in abdomen, back and limbs, and of difficulty in seeing. The pains are chiefly in the knees and ankles. His *sight has been very indistinct* since he was “buried.” Says that if he looks at an electric light it takes him “five minutes” before he can see anything again. His vision has much improved since Dec. 8th, but he can only read when the type is close to his eyes and not for long; “it all becomes blurred.” Heart, lungs, and joints appear normal. Abdomen distended and tender in lower part. *Bowels not opened for five days.* Aperient is effective.

Vision : R.E. 5/60, L.E. 2/60. Media clear. Fundi natural.¹
Pupils and eye movements normal. Hearing normal.

Dec. 17th.—*Smell*: Fails to smell peppermint, ether, iodine tincture, and carbolic acid (1 : 40). *Taste* (tongue protruded): Very strong solution of sugar—tasted only after movements of tongue are allowed. Very strong solution of salt—“feels like petrol does on the hand,” tasted only after movements of the tongue are allowed. Solution of acid—“salty, like alum.”

Dec. 19th.—Complains that he does not sleep, but the sister in charge of his ward says that he sleeps well. *Treatment by suggestion* (during and without hypnosis) was begun, and continued daily until patient’s transfer to England. On the second trial and afterwards a state of light hypnosis was easily induced. The deeper stages, involving hallucinations, anæsthesia, and post-hypnotic amnesia, could not be reached on any occasion. But the lighter stages (in which the patient responded to suggestions that he could not open his eyes, close his hand, stop laughing, and the like) sufficed to bring about assurance of a good night’s sleep, gradual restoration of memory, and (later) improvement in visual and olfactory acuity, in near vision, in visual fields, and in colour sensibility. The improvement in visual acuity and near vision is shown in the following table:—

| — | Visual acuity. Both eyes. | Near vision. | |
|------------|------------------------------|---------------------------|-----------------------------|
| | | Right eye. | Left eye. |
| Dec. 15th. | Before hypnosis, 5/60. | No. 15 Jaeger (badly). | Less than No. 15 Jaeger. |
| „ 23rd. | After „ 3/36. | No. 12 Jaeger | No. 15 Jaeger (badly). |
| „ 26th. | { Before „ 1/6. | No. 6 „ | No. 12 Jaeger |
| | { After „ — | No. 4 „ | No. 10 „ |
| „ 27th. | „ „ 2/6. | No. 2 „ | No. 10 „ |
| „ 28th. | No „ 4/6. | No. 1 „ | No. 4 „ |

¹ Colonel W. T. Lister, A.M.S., reports (Dec. 15th) that under homatropine and cocaine the refraction of the patient’s eyes is as follows:

| | | | |
|----------|-------|----------|------------|
| R.E. ——— | + 2·5 | L E. ——— | — 1 ? |
| | + 2·5 | | 0 or — 0·5 |

He makes at the same time the following note on the fundi: “Right eye: Sector below disc is deficient in retinal pigment, so that the choroidal vessels are abnormally visible, but there is no pathological pigmentation and there are no areas of atrophy. Left eye: Internal crescent; vessels drawn to nasal side; and lack of retinal pigment on nasal side (nasal staphyloma). The atrophic appearance is more marked in this eye; even the choroidal pigment is deficient, giving a pale area. Maculae normal. Both discs are pale, and there is connective tissue by the sides of the vessels. The whole condition, in my opinion, might be congenital.”

The improvement in visual fields is shown on the annexed Chart 1.² The "functional" character of this restriction of fields is shown by the fact that the patient was never observed to collide with objects when walking, and that he was able to box here when convalescent.

The improvement in *colour sensibility* was as follows:—
Dec. 14th: Half-inch square of colour recognised at 22 cm. R.E., 7.5 cm. L.E. Dec. 27th: 350 cm. R.E., 50 cm. L.E. The sensibility of the eyes to red appeared to be keener than that to any other colour. Thus the red square was recognised at 100 cm. by the left eye on Dec. 27th, while other colours (yellow, blue, and green) could only be recognised at 50 cm. So, too, on Dec. 14th the visual field for the recognition of coloured squares was limited in both eyes to the fovea save in the case of red, the field for which in the right eye extended definitely, though slightly, beyond the fovea towards the nasal side of the retina.

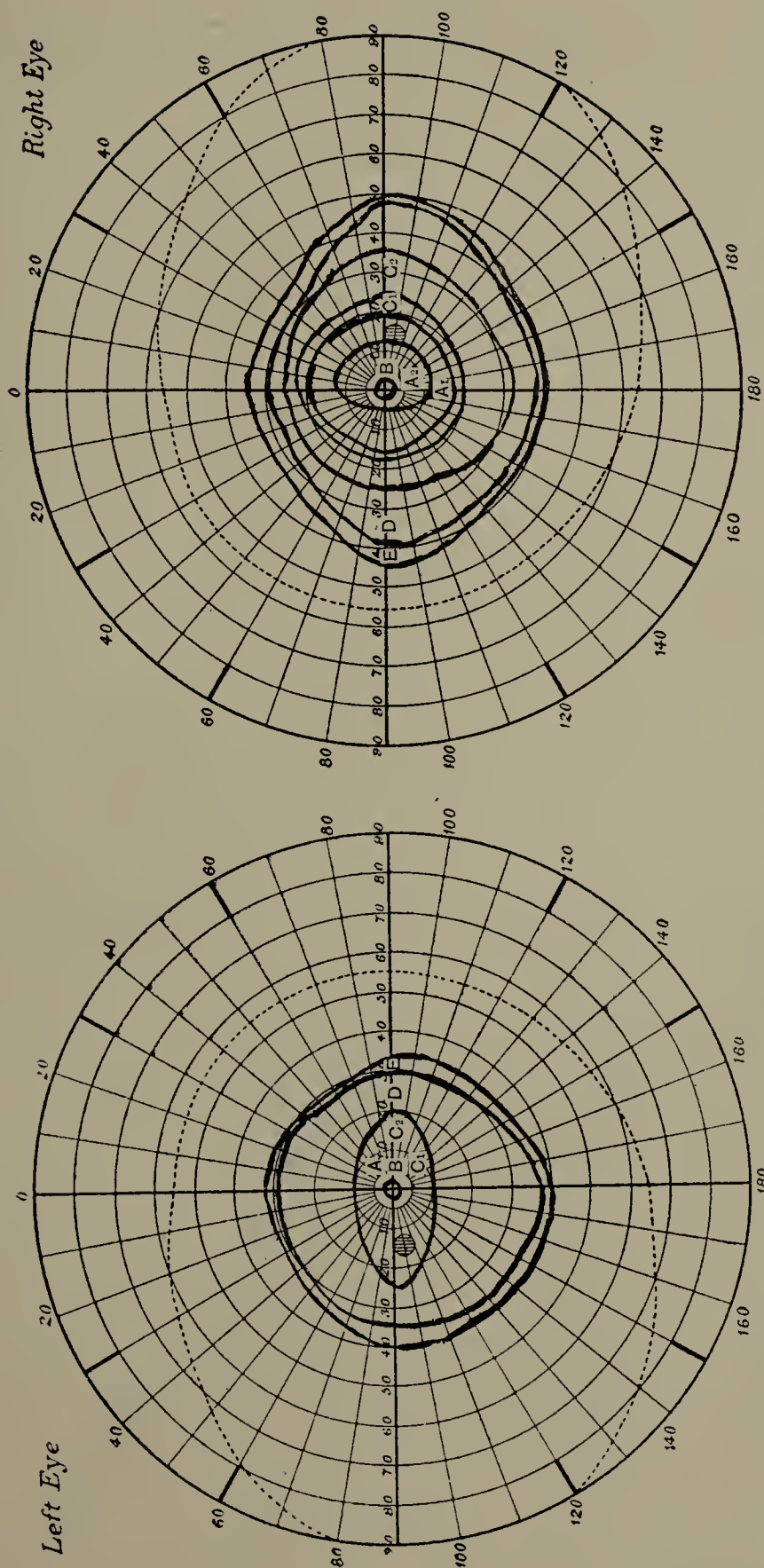
The improvement in *olfactory acuity* is shown by the fact that on Dec. 27th he was able to smell and to recognise ether, peppermint, camphor, and turpentine, although still unable to smell carbolic acid (1:10), tincture of iodine, or methylated spirit.

The gradual restoration of *memory* occurred as follows:—
Dec. 22nd.—During *hypnosis* suggestions made evoked a description of how the ground fell in on him at the trenches. He says that he was buried up to the neck and that Sergeant L. dug him out. Men of the N. Regiment (not of his own regiment) took him to their dressing station, but the medical officer there "packed him off" to the dressing station of the M. (his own) Regiment. He can now remember Captain S. (attached to his regiment from the —) speaking to him and giving him a drink. He spoke to him when he reached the barn (the M.'s dressing station). While under hypnosis the patient is told that he will remember this when he awakes. He does so, but cannot explain why he had not been able to recall it before.

Dec. 23rd.—To-day, *before hypnosis*, he remembers another "big hospital" to which he was taken on leaving the barn—a "big square room with a stove in the centre"—opposite which he was placed. But he cannot recall how he got there, or how he left to come here by train. He cannot remember being carried on a stretcher until they took him out of the train at Étaples (the railway station for this hospital). He says that there was "no light" in the barn all the time he was there (24 hours). He remembers struggling in the trench "for hours" after he was buried. Finally he gave it up. "I went to sleep, and was enjoying myself at home when they started 'messing me about.'"

² My thanks are due to Colonel Lister, A.M.S., who, by presenting the hospital with a portable perimeter and test types, made these observations now possible.

CHART 1.



Perimeter charts from Case 2. A, Dec. 14th; A₁ at start, A₂ after testing other eye; B, Dec. 21st; C, Dec. 26th, C₁ before hypnosis, C₂ after hypnotic suggestion; D, Dec. 27th; E, Dec. 28th.

Someone fell on me and woke me up. I 'tumbled to things a bit' when they got me out. I got up and then fell down, and it was all a 'wash out.'"

Under hypnosis he confirms the above, adding that in his struggles in the trench he "said a prayer or two," and that when he fell asleep he thought himself in the R. Hotel at S., where he had lived for years and is well known. "I was listening to a young lady I know [not intimately] playing the piano. I saw Mr. S. [the landlord] and Mrs. S. The sleep and dreams kept coming and going. It was dark when they dug me out. After I got out a chap said 'the fellow's mad,' and I said 'You're a liar.' Now, I remember a place between the barn and the hospital, rather a smart building, a long, low place. I was on a stretcher there. I must have got there by a horse ambulance, but I cannot remember this."

Dec. 26th.—*Before hypnosis* he recalls going to the clearing hospital (just mentioned) from the barn in a horse ambulance on a stretcher at midnight. He says: "I can remember talking to a major the next morning and having a sleeping draught at night. Then I went to another hospital at B. I had a ride in a motor ambulance on a stretcher, but whether this was from or to that hospital I cannot remember. I remember the journey in the train here distinctly. There were continual offers of tea, cocoa, sweets, and cigarettes. They wouldn't let us sleep for these things. I had a bad headache all the way down from the trenches. I did not bother much about my sight, as I thought it was imaginary. It wasn't until I got rid of the pain in my stomach which I came in with that I began to find my sight wouldn't let me read."

Dec. 27th.—*While in hypnosis* he gives the name of the man in the same trench with him as K. He "sees" very clearly the position of the trenches, their shallowness and covering. He remembers that he had been two days in the reserve trenches before he was sent on Dec. 7th to the firing line. He says, "The explosion lifted us up and dropped us again. It seemed as if the ground underneath had been taken away. I was lying on my side, resting on my hand, when the shell came. I got my right hand loose, but my left was fixed behind a piece of fallen timber. At last I dropped off to sleep and had funny dreams of things at home. One dream in particular I have thought over many times since. I haven't been able to make out why I should dream of the young lady playing the piano. I don't know her name and don't think I have seen her above twice."

Dec. 29th.—*Before hypnosis* he says that he can now "see" the N.'s dressing station—a one-storeyed house with two non-communicating rooms. He was taken first into the left-hand room, and later into the other in which the medical

officer sat. No further information obtainable *under hypnosis*. He cannot recall how he got to the N. dressing station from the trenches.

To recover the memory of this period other methods, in addition to hypnosis, were vainly tried. His dreams were generally of incidents belonging to earlier periods of the war, never of the trench-shelling. Attempts to obtain revival of the lost memories by getting him (a) to concentrate his attention on the scene of the shell bursting or of the N. dressing station, or (b) to record his thoughts when in a state of reverie, were fruitless.

How far the patient's memory, so far as it returned, can be trusted is not altogether certain. A man of the same regiment happened to be wounded here at the time. He believes that the patient could not have remained in the trench for longer than an hour after the shell had burst. He declares that he saw him get out of the trench and report himself sick to Corporal R., and that he heard Corporal R. tell the patient to go off on foot to the M. dressing station. Until the day after the patient's arrival at the barn he never saw the patient again, when he was brought in himself there. He says that the doctors at the barn considered the patient "off his head." He does not believe that the N. Regiment was anywhere in the neighbourhood. He says that the man K. had been mortally hit some days before.

On further examination the patient says he has no recollection of reporting himself to Corporal R. or of meeting his fellow patient while at the barn, and he is quite certain that *somehow* he reached the N.'s dressing station before he got to his own.

On the other hand, another fellow patient here happened to belong to the N. Regiment and was able to confirm the patient's account by stating that the trenches of the N. Regiment were on that day immediately next to those of the M. Regiment, and that the N. and M. dressing stations were situated in the same village, the former in a cottage about three-quarters of a mile beyond the latter, so that one would have to pass the M. dressing station on the way from the trenches to the N. dressing station.

There is hence a possibility that the patient

wandered in a state of somnambulism from the trench past his own dressing station to that of the N.'s or that he wandered first into the N. trenches and was then brought, as he avers, to the dressing station by men of the N. Regiment. But of this last point the patient is not now so certain. He still insists that a man stepped into his fallen trench on top of him.

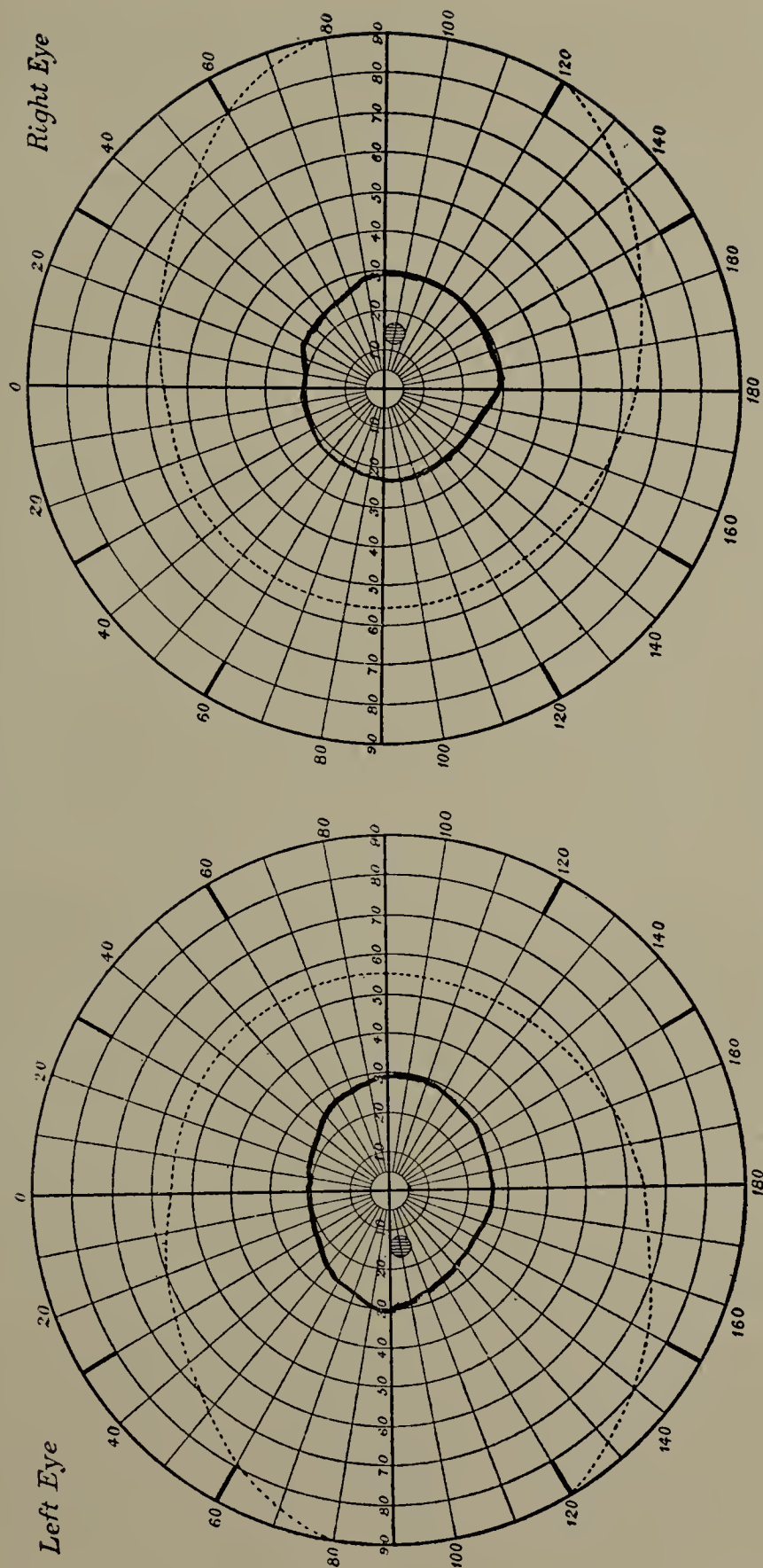
On Dec. 30th the patient was transferred to England for further treatment, and on the 31st he was admitted to the London Temperance Hospital under the care of Mr. J. S. Hosford, whence he has, I understand, now been discharged.

CASE 3.—Private, aged 23. Admitted on Jan. 26th, 1915. The patient says that he was blown off a heap of bricks 15 feet high owing to a shell bursting close to him. Thinks he must have fallen into a pool of water, as he next remembers finding himself, about 3 P.M. the same afternoon, in a cellar near a church with his clothes drenched. He does not know how he got there or how he left the cellar, but he remembers being in another hospital before he was admitted here. He cannot say if anyone was in the cellar with him. He remembers someone in the train talking to him and reminding him of being in the cellar.

Present condition.—*Jan. 27th.*—A healthy-looking man, well-nourished, but obviously in an extremely nervous condition. He complains that the slightest noise makes him start. His legs feel weak, and he has pain in the precordial region. His *sight has been very much impaired* since the shock. Distant vision, he says, is affected, and objects and type become blurred when long looked at. He has slept very little the last two nights. Heart, lungs, and joints appear normal. Abdomen, general spasm of muscles of wall on being touched. Hands tremulous. Knee-jerks normal, but the first attempts to evoke them provoked a spasm of the calf muscles and a few general convulsive movements as the patient lay in bed. His hands became very tremulous and his forehead sweated profusely. He appeared as if about to faint, and says that he felt cold and dizzy, and experienced “round and round movements of the stomach.” The slightest touch on the legs provoked well-marked spasm of the quadriceps muscles of the same thigh. Plantar reflexes not obtainable. Extensor muscles of the toes appeared to be in a state of tonic contraction.

Jan. 30th.—Slept well last night for the first time. *Bowels not opened for five days* since the shock. Took an aperient last night and this morning; bowels open to-day. *Eyes:* Fundi normal. *Fields, distinctly contracted*, as in Chart 2. Near vision, either eye, No. 14 Jaeger; less for

CHART 2.



Perimeter charts from Case 3, showing contraction of fields.

short words. Visual acuity (investigated by Colonel Lister, A.M.S.)—at first 6/24, but improved by encouragement and the indiscriminate use of weak + or — lenses to nearly 6 6. *Smell*: Has complained until to-day of a *subjective sensation* of the odour of cordite. This has left him “since the bowels were open.” *Left nostril fails to detect* smell of ether, peppermint, eucalyptus, ammonia, carbolic acid, or iodine tincture, all of which, save the last, are at once recognised when placed beneath the right nostril. No signs of nasal obstruction. *Taste*: *Only tastes very strong* solutions of sugar, salt, and acid, and then only when the tongue has been withdrawn and moved about the mouth; the taste is described as “*faint*.”

Feb. 1st.—He complains that he gets very excited when anyone addresses him. He still fails to remember how he got to the cellar, but he now remembers someone there asking him his name and regiment. He says: “When I got into the hospital before I came to this one I can now remember being put against a wall and then being taken into a small room to see the doctor, who gave me a ticket and told me I was suffering from concussion. I think I must have gone to sleep after this, as I don’t remember anything else until I was in the train. There a Royal Army Medical Corps bearer brought me a German prisoner to talk to. He was in the Bavarian Guard and had just seen his first action.

[Patient is still under treatment.]

Comment on these cases seems superfluous. They appear to constitute a definite class among others arising from the effects of shell-shock. The shells in question appear to have burst with considerable noise, scattering much dust, but this was not attended by the production of odour. It is therefore difficult to understand why hearing should be (practically) unaffected, and the dissociated “complex” be confined to the senses of sight, smell, and taste (and to memory). The close relation of these cases to those of “hysteria” appears fairly certain.

I have to thank Captain W. P. S. Branson and Captain H. Pritchard, R.A.M.C., in whose wards these patients were placed, for permission to make these investigations, and Major Gordon Watson, R.A.M.C., Commandant, for permission to publish them.

